PALO VERDE IRRIGATION DISTRICT

180 WEST 14TH AVENUE • BLYTHE, CALIFORNIA 92225

TELEPHONE (760) 922-3144

March 10, 2011

Mr. Baryohay Davidoff
Dept. of Water Resources
P. O. Box 942836
Sacramento, CA 94236-0001

Re: March 4, 2011 Draft Agricultural Water Measurement Title 23, Div 2, Chapter 5.1, Article 2 Section 597 to 597.6, Conference call session

Dear Mr. Davidoff:

Around February 8th, 2011, we received your 2/4/11 announcement on workshops for 2010 Urban Water Management Plans. We called Ms. Huff and were told that as an ag agency we didn't need to worry about SBX7-7 and these workshops. On Tuesday February 15, 2011, we found out from Ms. Anisa Divine at Imperial Irrigation District that was not completely true, that SBX7-7 did have components that applied to agricultural water supply agencies when she forwarded what information she had. She followed up with the Webinar announcement email for yesterday. I tried to attend but didn't have the software installed so I listened in on the regular phone. As an agricultural water supplier, Palo Verde Irrigation District is an interested party.

Regarding the 7 page Draft of Sections 597 thru 597.6 for ASC A2 subcommittee discussion purposes only: I have the following comments:

1. On page 1, Section 597 reference to Section 10608.48(b)(1) refers to the volume delivered to customers. On page 4, Section 597.3 paragraphs (a) and (b) refer to measurement of delivered water at each delivery point or location using devices that are certified (Section 597.5)to be accurate to within +-?% by flow rate, velocity, or volume. These accuracy requirements need to be modified to take into account field conditions, type of canal or delivery system being used, ability of person taking data to take reliable values in a short time, weather conditions, and operation methods.

For our open unlined canals, our ability to take accurate data is impacted by winds, wave action, blowing dust, rain, darkness, changes in flow in canal, and time between visits to delivery point. The required data is not being taken by a registered Professional Engineer with assistants and plenty of time under pristine steady state conditions to obtain the necessary data during a cool day with no flying ants, mosquitos, bees, or wasps to distract the observations. We don't have data loggers at each location with a fully charged battery to keep track of the instantaneous flow, time when flow changes occurred, and how long the irrigation event lasted.

Our standard PVID 'customer' turnout consists of a concrete formed head and 33inch wide by 6 foot high steel gate that is designed to measure the water flow rate using a submerged orifice method with an average coefficient of 0.70 as determined in the 1960's by numerous Price AA Current Meter meterings. Concrete, steel, plastic, or high density polyethylene (HDPE) pipe is attached to the head to carry the water to the farmer's field ditch. Due to field conditions the pipe is between 18 and 48 inches in diameter or a combination of sizes. Usually, the pipe is on a flat slope and is about 24 feet long but can be 20 to 130 feet long or more. To go under highways or county roads or over drains, the pipe may have to be dropped 3 or more feet from one level to a lower level and then raised back up to field grade so the water can enter the field ditch. Our turnout is customized and assembled in the field and poured in place.

We have around 2,500 of this type of 'customer' turnouts and check structures in our system because they don't leak and we can fix them if they do start leaking. The ditch rider has to cover around 18,000 acres daily so the individual has to get the depth to water in front of and behind the gate and the gate opening depth to calculate the flow and write that information on the sheet that stays at the gate. If we don't know the times involved, then the ditch rider has to estimate the time when the irrigator started and/or when the irrigation stopped. Each day, the flow rates are averaged and for the time water was flowing thru the gate, the volume of water in acre feet is calculated. Human errors in taking the data and field/weather conditions influence the error factor in addition to the error factor for the particular structure design. Perhaps the largest error factor is in estimating the time water flowed thru the gate for that day. At night, the irrigators sometimes reduce the flow so they can go home or catch a quick nap but we have no way of telling how much the flow was reduced or for how long. Your proposed accuracy values do not take this into account. Even if the structure was certified by a registered Professional Engineer, the person obtaining the data is not a registered Professional Engineer. Due to the various issues

involved in taking the data, I believe the actual volume calculated would not meet the required specification most of the time. Instead of requiring the structures to be certified for accuracy, is there some other way of obtaining the accuracy using each agencies staff instead of providing the registered Professional Engineers all this expensive busy work?

2. The amount of water diverted into our canal system is needed for balancing the various water amounts with the amount delivered to customer. The equation would be:

   acre feet Delivered to Customers = 'acre feet diverted' less 'acre feet operationally spilled to River' less 'acre feet operationally spilled to drains' less 'acre feet evaporated from canal' less 'acre feet lost by seepage into ground' plus 'acre feet of rainfall'.

The United States Geological Survey (USGS) and the Bureau of Reclamation (USBR) monitor the volume of water we divert from the Colorado River. They have told us under the best of conditions, their flow metering results in cubic feet per second (cfs) with a Price AA Current Meter is plus or minus 5%. The USBR uses a doppler system for instantaneous flow measurements but that is checked periodically by USGS using a Price AA Current Meter. We use a USGS rating table (based on an adjusted water surface elevation difference) daily to calculate the flow in cfs between metering events by those two agencies. Their metering events determine the rating curve adjustment factor to the elevation drop between up and down stream elevations that is used until the next metering event (between 2 and 6 months apart). The USGS publishes daily preliminary data subject to review. About 22 days after the end of the month, the USGS publishes a provisional value. About 9 months after the end of the water year, they publish the final values. Until these values are finalized, our data can change based on their changes.

For example, from USGS real time website for Station 09429000 Palo Verde Canal on March 8th, 2011 at midnight MST, upstream gage had an elevation of 283.63 feet, downstream elevation was 281.50 feet and a flow of 783 cubic feet per second. These readings by USGS are read every 15 minutes. They are averaged for the day and multiplied by the 24 hour period to get a daily volume. Aquatic weed growth in the channel influences the adjustment factor. Misreading this head difference by .01 feet would result in an error of 8 cfs.

Based on Section 597.3(b)(3), we will have to hire a registered Professional Engineer to certify the accuracy of this rated section of canal.

Are we to have this registered Professional Engineer recertify the accuracy each time a metering adjustment is made to calculate the flow rate? Why can't the USGS/USBR staff that have been trained by USGS/USBR to do these flow meterings be qualified to certify the accuracy requirement?

3. For Section 10608.48(b)(2) requiring pricing structure based on quantity: There needs to be a qualifier to this quantity. If we deliver 200 acre feet to a 40 acre parcel and 2,000 acre feet to a 400 acre parcel, the water use per acre of land is the same yet the quantity is 10 times larger. If we deliver 5,000 acre feet to a 1,000 acre parcel, the water use per acre of land is the same yet the quantity is 25 times larger than that delivered to the 40 acre's parcel. Would the intent of this section be meet if all three parcels were charged the same pricing structure?
4. For Section 597.4(b): For 2,500 delivery turnouts that are acting as the measuring devices, the paperwork for this documentation and certification is going to take up a lot of time and millions of dollars. Is this level of detail really necessary? If our monthly "delivered to customer" volume from our water delivery records agrees within 5% of the amount calculated by the equation in Comment #2, why wouldn't this result be an adequate measure of accuracy for delivered water?

Thank you for the opportunity to comment on this proposal. If you have any questions, please call me at 760-922-3144.

Sincerely

Roger Henning

Roger Henning
Chief Engineer